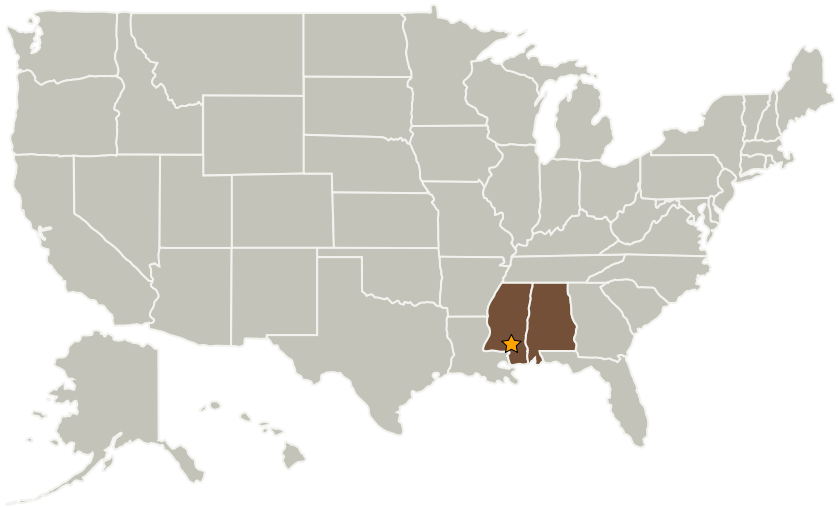
Intelligent Agents for Improved Ground-Test Operations, Phase I

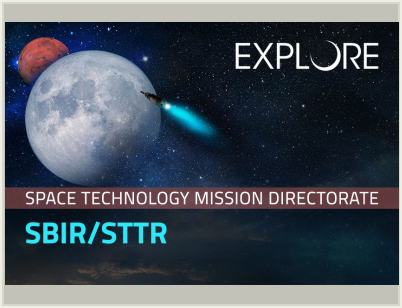
Completed Technology Project (2006 - 2007)

Project Introduction

The proposal outlines a research program for developing a novel soft-computing technology composed of an Artificial Immune System and Bayesian Belief Networks for monitoring, knowledge and information processing, and decision support infrastructure for testing of rocket engines of future spacecrafts. An engine failure during test operations may cause catastrophic results for the test article, supporting infrastructure, and potentially to supporting resources. The ability to effectively monitor health and status of a testbed and test article during a test firing and to take corrective measures for peak performance and improving reliable operations is of utmost importance. Using an existing SR-30 Jet Engine testbed utilizing artificial intelligence control techniques, novel algorithms are being developed by The University of Alabama that can function under faulty sensor conditions, can work effectively with thousands of sensors at high data rates, are self-checking, and are self-correcting can be of further support. The proposed effort builds on an existing joint MSFC/University of Alabama project where NASA's NSSTC is only funding graduate student research. This proposal will further enhance technology research for realization and synthesis of needed advanced algorithms in larger scale test platforms for propulsion health management, thereby furthering educational research addressing NASA's education missions.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
2L Research	Supporting Organization	Industry	OWENS CROSS ROADS, Alabama

Primary U.S. Work Locations	
Alabama	Mississippi

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.3 Collaboration and Interaction